

REMARKS

Claims 9 to 21, as amended, appear in this application for the Examiner's review and consideration. Claims 1 to 8 were canceled in a previous Amendment. Claims 15, 18, and 21 are withdrawn, as being directed to a non-elected species. The claims are fully supported by the specification and claims as originally filed. In particular, the recitations of the repair sleeve comprising openings in a shaft, the openings having first and second closed ends oriented towards the first and second shaft ends, respectively, and of inserting the repair sleeve into the guide thimble in the guide thimble opening in the top nozzle of the nuclear fuel assembly are supported by Figures 1 and 2 and page 4, line 8, to page 6, line 9, page 6, lines 29 to 32, and page 7, lines 15 and 16, of the present specification. Therefore, there is no issue of new matter.

Claims 15, 18, and 21 were objected to for the reasons set forth on page 2 of the Office Action. In response, Applicants submit that the status identifiers of those claims have all been changed to "withdrawn." Therefore, it is respectfully requested that the Examiner withdraw the objection to claims 15, 18, and 21.

Claims 9 to 13, 16, and 19 stand rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 5,645,282 to Berglund et al. (Berglund), for the reasons set forth on page 5 of the Office Action and section 2 of the November 19, 2007, Final Office Action, as incorporated by the present Office Action; and

Claims 14, 17, and 20 stand rejected the 35 U.S.C. § 103(a), as being unpatentable over Berglund, for the reasons set forth on page 6 of the Office Action and section 3 of the November 19, 2007, Final Office Action, as incorporated by the present Office Action.

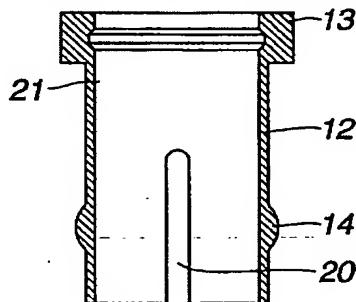
In response, Applicants submit that the presently claimed invention is directed to a method for repairing a nuclear fuel assembly. The claimed method comprises providing a repair sleeve having a shaft with a first end, a second end, and a diameter. The diameter is configured to fit into a guide thimble in a guide thimble opening of a top nozzle of the fuel assembly, where the guide thimble is connected to the top nozzle. The diameter of the shaft is dimensioned, such that an exterior of the shaft fits into the guide thimble in the guide thimble opening.

The shaft has at least two openings. Each opening has a first closed end, oriented towards the shaft first end, and a second closed end, oriented towards the shaft second end, and a tendon connecting the first closed end and the closed second end of each opening. The tendon bridges the first and second closed ends of each opening, dividing each

opening into two portions. The tendons are configured to deflect in an instance of a horizontal load on the tendon during insertion. Each of the tendons has at least one projection configured to be inserted into a dimple of a guide thimble sleeve. The repair sleeve has a lapped edge for installation on the top of the top nozzle of the nuclear fuel assembly.

The claimed method also comprises inserting the second end of the shaft of the repair sleeve into the guide thimble in the guide thimble opening in the top nozzle of the nuclear fuel assembly, the guide thimble connected to the top nozzle, such that the second end of the tendon and the second end of the opening are inserted into the guide thimble before the first end of the tendon and the first end of the opening are inserted into the guide thimble, and the projections of the tendons project into the dimples of the guide thimble sleeve. A thimble insert assembly is also inserted into an interior of the repair sleeve.

In contrast, Berglund discloses a fuel assembly for a nuclear reactor, having a guide sleeve 12, having a slit 20, as illustrated in Figure 4 of Berglund:



See also, Berglund, column 3, lines 23 to 29. As cited in the Office Action, the slit 20 is one of a pair of symmetrical slits in the guide sleeve 20, and those portions of the sleeve incorporating the bead 14 correspond to the tendons recited in the present claims.

However, as illustrated in Figure 4, any slit 20 present in sleeve 12 lacks the presently claimed first closed end, oriented towards the shaft first end, and second closed end, oriented towards the shaft second end, and a tendon connecting the first closed end and the closed second end of the opening, such that the tendon bridges the first and second closed ends of the opening, dividing the opening into two portions. First, as illustrated in Figure 4, the slit 20 has only one closed end, and Berglund does not disclose or suggest a sleeve having two openings, each opening having first and second closed ends, as presently claimed.

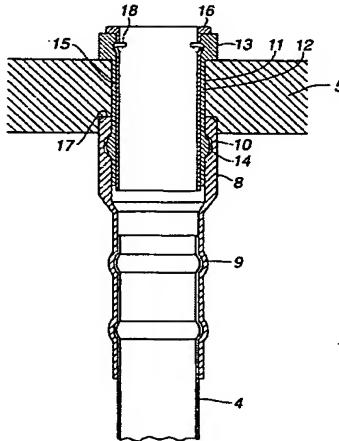
Using the reasoning set forth on page 3 of the Office Action, “[the] slit must inherently cut across the full transverse dimension of the sleeve because otherwise the compression force on the sleeve during the mounting process would not be uniform,” one of ordinary skill in the art would have no reason to close the open end of the slit 20 disclosed by Berglund. Without the open end of the slit 20 and/or more than two slits, the sleeve 12 would not provide the resiliency to compression forces required to insert the sleeve. It is important to note that it is primarily the tendons that provide the resiliency to compression forces in the presently claimed invention, not the body of the repair sleeve used in the method of the invention.

Second, the sleeve 12 and the slit 20 disclosed by Berglund can be considered in only two ways, neither of which provides tendons that bridge the first and second end of each of two openings in a repair sleeve, dividing each opening into two portions, as presently claimed. The slit 20 cannot be both a single opening divided into two portions by a tendon and two separate openings at the same time.

Assuming for the sake of argument that the portion of the sleeve 12 incorporating the bead 14 is a tendon, dividing the opening into two portions, Berglund discloses only one opening or slit 20 in the sleeve 12 that is divided into two portions by the “tendon.” Based on the reasoning that the portion of the sleeve 12 incorporating the bead 14 is a tendon, the “tendon” must divide a single slit into two portions, and, thus, Berglund would disclose only a single slit.

Alternatively, if the sleeve 12 has two slits 20, there is no “tendon” that divides each opening into two portions as presently claimed. Berglund may disclose two slits 20 in a sleeve 12. Berglund does not disclose or suggest a repair sleeve, having at least two openings, each of the two openings having a tendon dividing the opening into two portions, as presently claimed. At most, Berglund discloses a guide sleeve having two open ended slits. Berglund does not disclose or suggest the repair sleeve required in the presently claimed method, and, thus, does not disclose or suggest the presently claimed method.

In addition, as illustrated in Figure 2 of Berglund,



and discussed at column 2, line 62, to column 3, line 9, Berglund discloses:

[T]he upper end of the guide thimble 4 is joined to a top sleeve 8 by means of a number of beads 9. The upper end of the top sleeve 8 is provided on the inside with a first locking element in the form of a first internal slot 10. Through the top nozzle 5, a hole 11 is provided into which is inserted from above a guide sleeve 12 provided with a flange 13. The guide sleeve 12 is provided with a second locking element in the form of a bead 14 extending around the guide sleeve 12. The bead 14 is adapted, in mounted position, to fit into the first locking element that is, the first slot 10. A locking sleeve 15 with a flange 16 is adapted to be insertable from above into the guide sleeve 12. In the top nozzle 5, a seat 17 for receiving the top sleeve 8 is formed by the diameter of the through-hole 11 at the lower part of the hole 11 being larger than at the upper part thereof.

Therefore, the guide sleeve 12 is inserted into the hole 11 in the top nozzle 5. The upper end of the guide thimble 4 is joined to the top sleeve 8 by the beads 9. The bead 14 on the guide sleeve 12 is attached to the top sleeve 8. As a result, the top sleeve 8 connects the guide sleeve 12 to the upper end of the guide thimble 4.

However, Berglund does not disclose or suggest inserting the guide sleeve 12 into the guide thimble 4. The guide thimble 4 clearly terminates at its upper end just above the bead indicated as 9 in Figure 4. Berglund does not disclose or suggest inserting the second end of the shaft of the repair sleeve into the guide thimble in the guide thimble opening in the top nozzle of the nuclear fuel assembly, the guide thimble connected to the top nozzle, such that the second end of the tendon and the second end of the opening are inserted into the guide thimble before the first end of the tendon and the first end of the opening are

inserted into the guide thimble, and the projections of the tendons project into the dimples of the guide thimble sleeve, as presently claimed. Therefore, Berglund does not disclose or suggest the presently claimed method.

As Berglund does not disclose or suggest the presently claimed invention, the present claims are not anticipated by or obvious over that reference. Accordingly, it is respectfully requested that the Examiner withdraw the rejections of claims 9 to 13, 16, and 19 under 35 U.S.C. § 102(b) and claims 14, 17, and 20 under 35 U.S.C. § 103(a) over Berglund.

Claims 9 to 14, 16, 17, 19, and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over either of U.S. Patent No. 4,699,759 to Feild, Jr. (Feild) or U.S. Patent No. 4,751,039 to Delevallee et al. (Delevallee) in view of either U.S. Patent No. 3,791,466 (denoted as 4,699,759 in the Office Action, but as 3,791,466 in the Notice of References Cited) to Patterson et al. (Patterson) or Berglund for the reasons set forth on pages 5 of the Office Action and section 4 of the November 19, 2007, Final Office Action, as incorporated by the present Office Action.

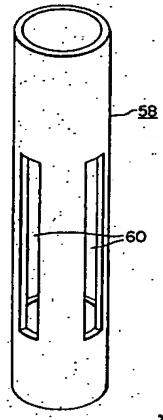
In response, Applicants submit that the cited references, whether taken alone or in combination, do not disclose or suggest the presently claimed invention. Feild, discloses a joint structure 46 that includes a locking tube 58 that can be removably inserted into the upper end of a guide thimble. The locking tube 58 includes upper and lower axially, and circumferentially displaced protuberances 60 and 62, but no openings. See Figures 2 and 5 and column 6, lines 49 to 68 of Feild.

Similarly, Delevallee discloses a method of installing a spacing sleeve as a liner in an instrumentation tube of a fuel assembly, where a sleeve is inserted into an instrumentation tube, and a cap is inserted into the sleeve. See Delevallee, column 1, line 49, to column 2, line 5, and column 4, lines 36 to 54. Delevallee may disclose inserting a sleeve into an instrumentation tube and a cap into the sleeve, but there are no openings in the sleeve and the cap.

Patterson and Berglund do nothing to overcome the deficiencies of Feild and Delevallee. As discussed above, Berglund does not disclose or suggest a repair sleeve, having at least two openings, each opening having first and second closed ends, and each of the two openings having a tendon dividing the opening into two portions, as presently claimed. Even if the disclosure of Berglund was combined with that of Feild and/or Delevallee, the resulting combination would not provide a repair sleeve, having at least two openings, each opening having first and second closed ends, and each of the two

openings having a tendon dividing the opening into two portions required in the presently claimed method, and, thus, would not provide the presently claimed method.

With regard to Patterson, the present Office Action states, “[i]t is [the] teaching in Patterson on the resilience provided by multiple slots and NOT the tendons that examiner applies in modifying the primary references” (emphasis in the original). The Office Action then cites Patterson at column 5, lines 10 to 16, where Patterson describes the sleeve 58, as illustrated in Figure 11,



as follows:

Four slots 60 located in the sleeve 58 at 90° intervals, as shown in FIG. 11, make it possible to insert the sleeve into a grid cell as the grid is assembled for brazing. During this assembly it is necessary to slightly deform a 90° segment of the lower circular section of the sleeve in order to fit it between the grid straps.

Therefore, as admitted in the Office Action, and disclosed and illustrated by Patterson, Patterson discloses a sleeve having four slots without tendons at 90° intervals. It is well settled law that a *prima facie* case of obviousness requires the citation of prior art that discloses or suggests all elements of the claimed invention. Patterson does not disclose or suggest a sleeve, having at least two openings, each opening having first and second closed ends, and each of the two openings having a tendon dividing the opening into two portions, as presently claimed. Even if the disclosure of Patterson was combined with that of Feild or Delevallee, the resulting combination would not provide the presently claimed invention. The combination would not provide the repair sleeve required in the presently claimed method, and, thus, would not provide the presently claimed method.

Therefore, Feild, Delevallee, Berglund, and Patterson, whether taken alone or in combination, do not disclose or suggest the presently claimed invention, and the present

claims are not obvious over those references. Accordingly, it is respectfully requested that the Examiner withdraw the rejection of claims 9 to 14, 16, 17, 19, and 20 under 35 U.S.C. § 103(a) over Feild or Delevallee in view of Berglund or Patterson.

Applicants thus submit that the entire application is now in condition for allowance, an early notice of which would be appreciated. As claim 9 is in condition for allowance, Applicants respectfully request that the Examiner rejoin withdrawn claims 15, 18, and 21. Should the Examiner not agree with Applicants' position, a personal or telephonic interview is respectfully requested to discuss any remaining issues prior to the issuance of a further Office Action, and to expedite the allowance of the application.

No fee is believed to be due for the filing of this Amendment. Should any fees be due, however, please charge such fees to Deposit Account No. 11-0600.

Respectfully submitted,

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Dated: July 7, 2008

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